What is PS Power Supply Protection



Overview

PSU Protections Explained | CORSAIRWhether it's over-current, under-current, over-voltage, over-temperature, or other current and temperature abnormalities.

Key Takeaways

Power Supply Protection (PS Protection) refers to the built-in mechanisms in a PSU that safeguard both the unit and connected devices from electrical faults, overloads, and abnormal operating conditions.

Overview

Power supply protection is a critical feature in both AC and DC power supplies, designed to prevent damage to the PSU and the connected load by responding to abnormal conditions such as short circuits, overcurrent, overvoltage, undervoltage, overheating, or excessive power draw. These protections ensure reliable operation, prevent component failure, and reduce risks like fire or permanent damage to sensitive electronics.

Key Types of Power Supply Protection

Over Voltage Protection (OVP) Shuts down the PSU if the output voltage exceeds a safe limit, preventing damage to sensitive components. Under Voltage Protection (UVP) Activates when the voltage drops too low, which could otherwise cause excessive current draw and potential overheating of cables or connectors. Over Current Protection (OCP) Monitors the current drawn by the load and shuts down or limits output if it exceeds a preset threshold, often using shunt resistors for fast response.

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Over Power Protection (OPP) Limits the total power output to prevent the PSU from supplying more than its rated capacity, typically shutting down at 110–140% of the rated wattage. Short Circuit Protection (SCP) Detects low-resistance faults between output terminals and quickly cuts off power to prevent thermal runaway or component damage. Over Temperature Protection (OTP) Uses thermistors or integrated circuits to monitor internal temperature and shuts down the PSU if it overheats, for example due to fan failure.

Protection Mechanisms

Power supplies implement these protections using integrated circuits (ICs), shunt resistors, thermistors, and control logic. Some protections operate in constant current limiting, foldback current limiting, or hiccup mode, allowing the PSU to either reduce output safely or repeatedly attempt restart until the fault is cleared. These mechanisms ensure that the PSU can survive abnormal conditions without permanent damage.

ImportancePS protection is essential for: Device safety: Prevents damage to computers, medical equipment, and consumer electronics.

PS

U longevity: Avoids overheating, overloading, and electrical stress. Operational reliability: Maintains stable voltage and current under fluctuating loads or faults. Compliance: Meets ATX and other industry standards for safe PSU operation.

In summary, PS Protection is a suite of safety features in power supplies that actively monitor and respond to electrical anomalies, ensuring both the PSU and connected devices operate safely and reliably.

Article Content

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PSU Protections

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Over Power Protection or OPP is a protection that will shut down the PSU when too much power is pulled, generally this is between 110 and 140% of the advertised wattage.

Understanding PSU protections

To implement OCP in a PSU, two things are necessary: shunt resistors and a supervisor IC that supports OCP. The shunt resistors are low-resistance, high-precision resistors used to

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OCP is a feature that uses one or more circuits to prevent a power supply from delivering more current than its circuits and cables can handle. OCP is important because high currents can

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